(b) Remarks:

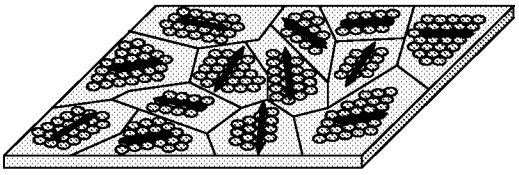
The claims are 1-18 with claims 1, 5, 6, 7, 8, 15 and 16 being independent. Claims 6-13 and 16 have been withdrawn. Rejoinder of claims 6-13 and 16 is requested upon an indication of allowability of claims 1-5, 14, 15, 17 and 18. Reconsideration of the pending claims 1-5, 14, 15, 17 and 18 is requested in view of the comments which follow.

Applicants wish to clarify the status of the claims. In the Official Action of September 14, 2007, claims 6-13 and 16 were withdrawn as nonelected and claims 1-5, 14 and 15 were rejected. In Applicants' response of December 14, 2007 new claims 17 and 18 were added. In this action in Box 4a in the Summary claims 6-16 are said to be withdrawn and claims 1-5, 17 and 18 were rejected. The record should be clarified that claims 6-13 and 16 are withdrawn and claims 1-15, 14, 15, 17 and 18 are rejected.

Claims 1, 5, 15, 17 and 18 were rejected as either anticipated by or as obvious over the Besson article. Claims 2-4 and 14 were rejected as obvious over Besson in view of Liu '626. The rejection is respectfully traversed.

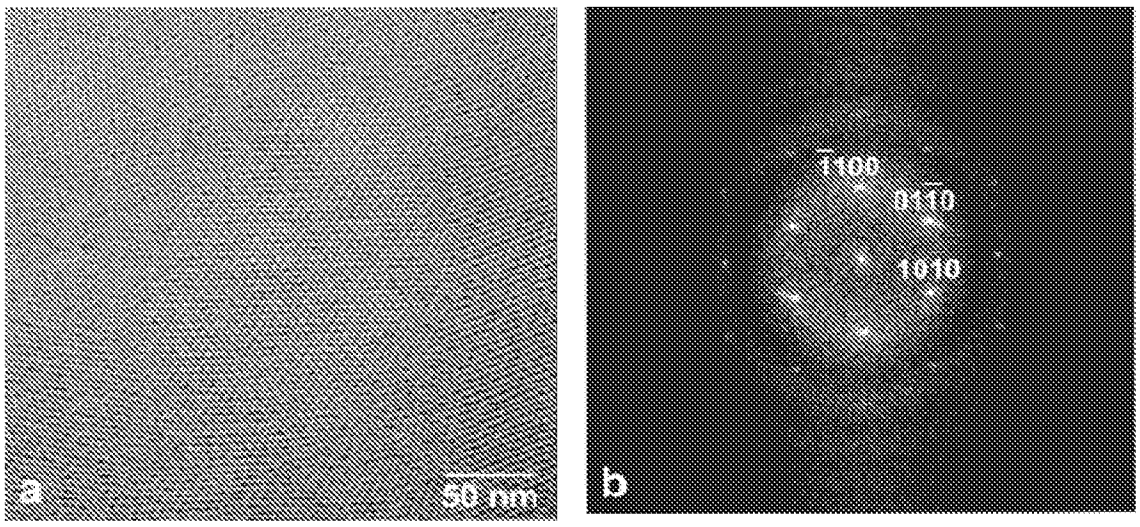
The Examiner acknowledges that the applicants have argued as follows:

"The mesoporous silica thin film in the cited Besson, et al. article can be schematically illustrated in the following drawing (A).


(A)

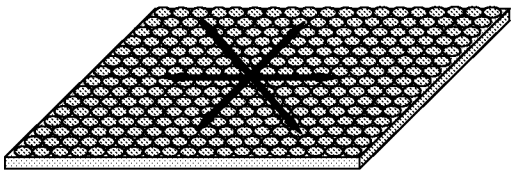
That is, while the film locally has a 6-fold symmetrical structure, the arrangement direction is not regulated across the entire film. The domains of the 6-fold

symmetry have various degrees of freedom of rotation in the film and are randomly aligned. The above alignment of domains is indicated in "Figure 1" of the cited Besson article as reproduced below.



The above diffraction pattern "a" indicates the presence of local structures with 6-fold symmetry. However, the electron micrograph "b" of the diffraction pattern "a" clearly shows that domains different from the direction of the symmetric mirror planes of 6-fold symmetry are present in the film. In other words, the film in the Besson, et al., article exhibits a porous structure similar to that of a polycrystalline structure.

In contrast, the mesoporous silica thin film in the present claimed invention can be schematically illustrated as in the drawing below.



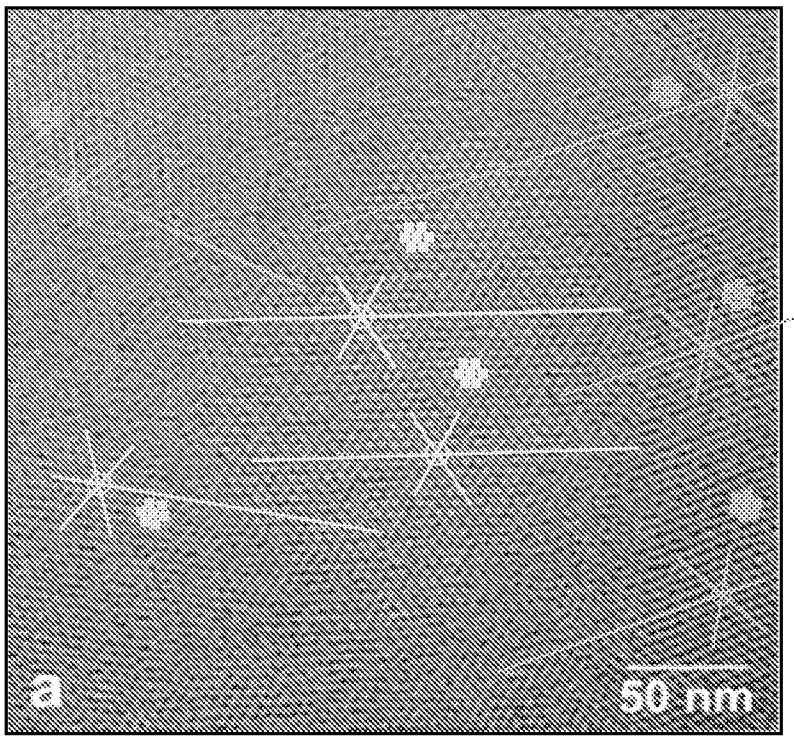
That is, unlike the structure of the mesoporous silica thin film in the cited Besson, et al. article, in the mesoporous silica thin film of the present invention, the symmetric mirror planes of 6-fold symmetry are present in the same direction throughout

the film. In other words, the structure of the mesoporous silica thin film of the present invention is in a single-crystal state.

Accordingly, Besson, et al. teaches away from symmetric mirror planes of 6-fold symmetry in the same direction throughout the film. The evidence in Besson, et al. in its Fig. 1, especially 1(b) is to the contrary. Therefore, the Examiner's "inherency" argument must fail as well as the "reasonable presumption" argument."

In response the Examiner is unsure how applicants arrive at the schematic drawing "A". Further, the Examiner argues Besson teaches a structured orientation of mesostructure. The Examiner is unsure how Fig. 1b of Besson shows domains different from the symmetric mirror planes of 6-fold symmetry. Applicants were also asked to elaborate as to how the symmetric reflective surface across the entire film is obtained. Applicants welcome the opportunity to respond to the Examiner's concerns.

The Examiner has alleged the claimed features of the inventive film "would necessarily be present in the mesoporous silica film of Besson". However, the instant claimed features are structural features the film of Besson does not possess. Besson describes film structure on the basis of the results of plane TEM and section TEM. TEM is an analytical measure in which information on only an extremely minute area is provided. TEM analysis does not indicate the structure of the whole film. Please see Fig. 1a of Besson. The following figure shows an enlarged view of Fig. 1a of Besson.



It can be clearly seen from the above figure that in this film, there are domains in which the in-plane arrangement directions of spherical fine pores are different, and in the boundaries thereof, the fine pore structures are unclear. The in-plane domains are identified by the crossed circles and the direction of orientation of the pores is shown by the lines through the crossed circles. It can be said that the Besson film has a domain structure. (See the following portions in Besson article in which it is indicated that the film has a domain structure: page 12096, the left-hand column, lines 3-5 "… of the digitized HRTEM images of single domains in zone axis orientation (i.e., with one symmetry element parallel to the electron beam)."; and page 12096, the right-hand column, line 5 "… , as the film is strongly textured,".) That is, in many regions of the Besson film, when limited to very minute areas, there are 6-fold symmetric axes perpendicular to the film plane. However, since the various symmetric reflective surfaces face different directions depending on their positions in the film, the Besson film fails to satisfy the requirement

such that symmetric reflective surfaces face the same direction across the entire film. The direction of the domains is different over the in-plane region as shown by the non-parallel lines above.

It is understood that the Besson film has various 6-fold symmetric axes perpendicular to the film. As the Examiner indicated, Fig. 1b of Besson clearly shows certain 6-fold symmetry in the structure. However, it should be understood that the 6-fold symmetry can be found only in certain discrete areas of the in-plane arrangement in which the domains are not aligned in the same direction; which are defined by the diameter of an electron beam with which the diffraction pattern is determined.

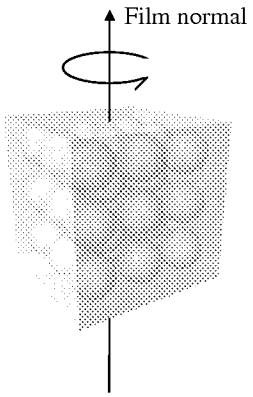
In Figure 1(b) of Besson, the symmetric reflective surfaces are denoted by straight lines and the same color is used to illustrate the structure in the same domain. In the same domain, the symmetric reflective surfaces are parallel to each other. However, in different domains, it can be clearly seen that the symmetric reflective surfaces face different directions from each other.

In the film of the present invention, the local structure has been confirmed by TEM. In addition, detailed X-ray diffraction analysis has proved that the arrangement of the spherical fine pores in the in-plane direction is in one direction only. This in-plane X-ray diffraction analysis employs an incident angle as small as 0.2°, so that the entire surface of the film is analyzed. Using this technique, when the in-plane direction of the fine pores was determined, it was found to be only a single, uniform direction.

If x-ray diffraction analysis is not applied, it is not possible to determine the in-plane direction of the fine pores across the entire film. Where the film of Besson is using in-plane X-ray diffraction analysis, the in-plane structure is seen to be isotropic (i.e.,

in all directions). The reason is that the Besson film has a domain structure, and each domain has a degree of freedom of rotation around an axis perpendicular to the film plane. Based on the above, the inventors depicted the film structure as shown in drawing (A).

As the Examiner indicated, Besson discloses that laminating in the layer thickness direction is uniform. However, the Besson film is composed of domains with different in-plane directions of the fine pores. Although exhibiting different in-plane directions for the domains, the film can be formed of a uniform structure in only the film thickness direction. Each of the domains in the Besson film has a symmetry in which the structure as shown in the following figure is rotated around an axis perpendicular to the film plane.



Accordingly, even though the domains have different alignments in plane, the film structure is uniform in the film thickness direction only across the entire film. This is consistent with the fact that the arrangement of the fine pores is not in the same direction in the film plane direction.

With respect to forming a film, the Examiner takes the position that since the conditions for forming the film of the present invention are similar to the conditions for forming the film of Besson, the present film should be similar to the Besson film. That

assumption is not correct. In the present invention a substrate is typically prepared with an orientation derived via rubbing or by use of an L-B film of a polymer. Two film-forming methods, quite different from each other, can be used. One of the two is a gel-sol technique. The other is a hydrothermal crystallization method. These two methods use similar raw materials, but reaction conditions such as the chemical species, reaction rate, pH, temperature, and the like, are different.

The structure of the film formed by the hydrothermal crystallization method is thermodynamically determined, and the structure of the film formed by another production method, such as a spin coat method, based on sol-gel chemistry, is subjected to a kinetics factor. Although similar raw materials are employed the different reaction conditions used cause different films to be formed. To show that different reaction techniques produce different films, a glass substrate without a polymer film formed thereon was subjected to a sol-gel deposition method to form a film. However, using the same materials, but employing a hydrothermal crystallization method, a continuous transparent film cannot be formed on the substrate.

Therefore, because different reaction parameters are selected in the present invention and because a different substrate surface is employed, the production method of the present invention yields different products from the process of Besson. Moreover, the structure of the claimed formed film is different from the structure of the Besson film as shown above.

The defects of Besson are not remedied by Liu. In Liu, there is no disclosure concerning the in-plane arrangement of spherical fine pores. In the present invention, the objective of mixing a surfactant is to improve the in-plane regularity of the

spherical fine pores. Thus, the mixing of a surfactant in the present invention and the effect resulting therefrom differ from those in Liu et al.

The Amendment should be entered, the claims should be allowed and the case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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